OBJECTIVES

Objectives Legend

C = Cognitive 1 = Knowledge level
P = Psychomotor 2 = Application level
A = Affective 3 = Problem-Solving level

COGNITIVE OBJECTIVES

At the completion of this lesson, the EMT student will be able to:

1. Define and discuss Actions, Indications, Contraindications, Dosages, Route, and Side Effects as they pertain to general pharmacology. (C-1)
2. Define Generic name and Trade name. (C-1)
3. Discuss the forms in which the medications may be found. (C-1)
4. Discuss the "6 Rights" of medication administration. (C-1)
5. Identify which medication will be carried on the unit.(C-1)
6. Describe the mechanisms of allergic response and the implications for airway management.(C-1)
7. Describe the assessment of a patient experiencing an allergic reaction and identify the assessment finding. (C-1)
8. Establish the relationship between the patient with an allergic reaction and airway management.(C-3)
9. Differentiate between the general category of those patients having an allergic reaction and those patients having an allergic reaction and requiring immediate medical care, including immediate use of epinephrine auto-injector.(C-3)
10. Describe the emergency medical care of the patient with an allergic reaction.(C-1)
11. State the generic and trade names, medication forms, dose, action, indication, route, side effects and contraindications for the epinephrine auto-injector.(C-1)
12. Discuss the NH Local Option Protocol for Anaphylaxis. (C-1)
13. Evaluate the need for medical direction in the emergency medical care of the patient with an allergic reaction.(C-3)

AFFECTIVE OBJECTIVES

At the completion of this lesson, the EMT student will be able to:

1. Explain the rationale for the administration of medications.(A-3)
2. Explain the rationale for administering epinephrine using an auto-injector.(A-3)

PSYCHOMOTOR OBJECTIVES

At the completion of this lesson, the EMT student will be able to:

1. Demonstrate the clinical assessment to determine the proper management of a patient experiencing an allergic reaction. (P-1, 2)
2. Demonstrate the emergency medical care of the patient experiencing an allergic reaction. (P-1,2)
3. Read the labels and inspect the medication.(P-2)
4. Demonstrate general steps for assisting patient with self-administration of medications.(P-2)
5. Demonstrate the use of epinephrine auto-injector.(P-1,2)
6. Demonstrate the assessment and documentation of patient response to an epinephrine injection.(P-1,2)
7. Demonstrate proper disposal of equipment. (P-1,2)
8. Demonstrate completing a prehospital care report for patients with allergic emergencies. (P-2)

PREPARATION

Motivation:	The ability to recognize and manage a severe allergic reaction (anaphylaxis) is possibly the only thing standing between a patient and imminent death.
Prerequisites:	NH Licensed at the level of EMT-Basic or higher.

MATERIALS

AV Equipment:	Utilize various audio-visual materials relating to allergic emergencies. The continuous design and development of new audio-visual materials relating to EMS requires careful review to determine which best meet the needs of the program. Materials should be edited to assure meeting the objectives of the curriculum.
EMS Equipment:	Epinephrine auto-injector, epinephrine auto-injector trainer, synthetic skin mannequin for injection, sharps container, gloves.

PERSONNEL

Primary Instructor:	One educator knowledgeable in EMS, the physiology of severe allergic reactions, the use of epinephrine auto-injectors and the NH Local Option Protocols.
Assistant Instructor:	The instructor-to-student ratio should be 1:6 for psychomotor skill practice. Individuals used as assistant instructors should be knowledgeable in allergic emergencies and the NH Local Option Protocols.
Recommended Minimum Time To Complete:	Three hours

PRESENTATION

Declarative (What)

I. General Pharmacology
   A. Overview - the importance of medications and the dangers associated with their administration.
   B. Actions - state desired effects a drug has on the patient and/or his body systems.
   C. Indications - the indication for a drug's use includes the most common uses of the drug in treating a specific illness.
   D. Contraindications - situations in which a drug should not be used because it may cause harm to the patient or offer no effect in improving the patient's condition or illness.
   E. Dose - state how much of the drug should be given.
   F. Route - state route by which the medication is administered such as oral, sublingual (under the tongue), or injectable.
   G. Side Effects - state any actions of a drug other than those desired. Some side effects may be predictable.

II. Medication names
   A. Generic
      1. The name listed in the U.S. Pharmacopedia, a governmental publication listing all drugs in the U.S.
      2. Name assigned to drug before it becomes officially listed. Usually a simple form of the chemical name.
      3. Give examples. (e.g. epinephrine, naloxone, etc.)
   B. Trade
      1. Brand name is the name a manufacturer uses in marketing the drug.
      2. Give examples. (e.g. Epipen, Narcan, etc.)

III. Medication Form
   A. Medications the EMT-Basic carries on the unit or medications that a patient may have a prescription for that the EMT-Basic may assist with administration.
      1. Compressed powders or tablets - (e.g. nitroglycerin)
      2. Liquids for injection - (e.g. epinephrine)
      3. Gels - (e.g. glucose)
      4. Suspensions - (e.g. activated charcoal)
      5. Fine powder for inhalation - (e.g. prescribed inhaler)
      6. Gases - (e.g. oxygen)
      7. Sub-lingual spray - (e.g. nitroglycerin)
      8. Liquid/vaporized - (e.g. fixed dose nebulizer)
   B. Each drug is in a specific medication form to allow properly controlled concentrations of the drug to enter into the blood stream where it has an effect on the target body system.

IV. 6 Rights of Medication Administration
   A. Right Patient
   B. Right Drug
   C. Right Dose
   D. Right Time
   E. Right Route
   F. Right Documentation

V. Role of Medical Control
   A. Offline / Standing orders
   B. Online orders
      1. Obtaining orders
   C. NH Local Option Protocols
      1. "Minimum " menu defined by Saf-C 5900
      2. "Maximum" menu approved by Medical Control Board (MCB)
      3. Defined at local level by Medical Resource Hospital (MRH)
      4. Scope of education v. scope of practice

VI. Allergic Reactions
   A. Defined as an exaggerated immune response to any substance ranging from mild and local reactions to severe and systemic reactions. Allergic reactions are progressive.
   B. Anaphylaxis is an exaggerated immune response to an allergen with a sudden rapid onset, systemic involvement and severe reaction.
   C. Possible causes
      1. Insect bites/stings - bees, wasps, etc.
      2. Food - nuts, crustaceans, peanuts, etc.
      3. Plants
      4. Medications
      5. Others
   D. Assessment findings may include:
      1. Skin
         a. Patient may state he has a warm tingling feeling in the face, mouth, chest, feet and hands.
         b. Itching - skin, throat, tongue, etc.
         c. Hives
         d. Red skin (flushing)
         e. Swelling to face, neck, hands, feet and/or tongue
      2. Respiratory system
         a. Patient may state he feels a tightness in his throat/chest.
         b. Cough
         c. Rapid breathing
         d. Labored breathing
         e. Noisy breathing
         f. Hoarseness (losing the voice)
         g. Stridor
         h. Wheezing (audible without stethoscope)
      3. Cardiac
         a. Increased heart rate
         b. Decreased blood pressure

4. Generalized findings
    a. Itchy, watery eyes
    b. Headache
    c. Sense of impending doom
    d. Runny nose
5. Altered mental status
6. Assessment findings that reveal shock (hypoperfusion) and/or respiratory distress (upper airway obstruction, severe bronchospasm, etc.) indicate the presence of a severe allergic reaction.
7. Be aware that these patients may initially present with airway/respiratory compromise or airway/respiratory compromise may develop as the allergic reaction progresses.

VII. Epinephrine

A. Medication name
    1. Generic - Epinephrine
    2. Trade – Adrenaline, Epipen, Epipen Jr.
B. Actions
    1. Dilates the bronchioles.
    2. Constricts blood vessels.
    3. Increased HR and Cardiac Output
C. Indications:
    1. Patient exhibiting the assessment findings of a severe allergic reaction (e.g. shock, respiratory distress, etc.).
    2. In compliance with squads Medical Resource Hospital's approved Local Option Protocols
D. Contraindications - no contraindications when used in a life threatening situation.
E. Medication form - liquid administered via an automatically injectable needle and syringe system.
F. Dosage:
    1. Adult - one adult auto-injector (0.3 mg)
    2. Child (10-30 kg / 22-66 lbs) - one infant/child auto-injector (0.15 mg)
G. Route - Deep IM injection in the lateral thigh midway between waist and knee
H. Side effects
    1. Increases heart rate
    2. Pallor
    3. Dizziness
    4. Chest pain
    5. Palpitations
    6. Headache
    7. Nausea
    8. Vomiting
    9. Excitability, anxiousness

I. Administration
    1. Obtain order from medical direction either on-line or off-line per Local Option Protocols.
    2. Obtain auto-injector and ensure:
        a. Confirm medication is in date
        b. Medication is not discolored (if able to see).
    3. Remove safety cap from the auto-injector.
    4. Place tip of auto-injector against the patient's thigh.
        a. Lateral portion of the thigh.
        b. Midway between the waist and the knee.
    5. Push the injector firmly against the thigh until the injector activates.
    6. Hold the injector in place until the medication is injected (approx. 10 seconds).
    7. Dispose of injector in biohazard container.
    8. Record activity and time.

VIII. Emergency medical care of allergic reactions

A. NH Medical Control Board (MCB) and Seacoast Food and Allergy Group worked on development of protocol allowing EMT-Basics to administer Epipens supplied on EMS unit. MCB adopted use of Epipen in 2003 NH Local Option Protocols (Anaphylaxis 2.2).

B. If patient has come in contact with substance that caused past allergic reaction **with signs** of respiratory distress and/or shock (hypoperfusion) **OR** if patient has a history of severe allergic reaction and is showing **any** signs or symptoms, even mild ones:
    1. Perform scene size up and initial assessment.
    2. Perform focused history (SAMPLE)
        a. History of allergies.
        b. What was patient exposed to.
        c. How were they exposed.
        d. What effects.
        e. Time of onset and progression of signs and symptoms.
        f. Interventions patient has done already.
    3. Perform focused physical assessment
        a. Reassess ABCs
        b. Assess respiratory system
        c. Breath sounds
        d. O2 saturation
        e. Assess cardiovascular system
        f. Assess baseline vital signs.
    4. Administer oxygen if not already done in the initial assessment.

5. Per NH Local Option Protocol, determine if patient has prescribed preloaded epinephrine available and facilitate administration of prescribed preloaded epinephrine. If patient does not have prescribed epinephrine and has history of anaphylaxis administer epinephrine. If patient has no history of anaphylaxis but exhibits signs and symptoms, contact Medical Control. If unable to contact Medical Control, follow standing orders from Local Option Protocols including administration of epinephrine.
6. Consider an ALS intercept if available.

C. If patient has contact with substance that causes allergic reaction **without signs** of respiratory distress or shock (hypoperfusion) and has no history of severe allergic reactions:
    1. Scene size up and initial assessment
    2. Perform focused history and physical assessment.
    3. Patient not wheezing or without signs of respiratory compromise or hypotension should not receive epinephrine.

IX. Re-assessment strategies
- A. Transport.
- B. Record and reassess in two minutes after injection of medication.
- C. Continue assessment of airway, breathing and circulatory status.
    1. Patient condition continues to worsen (i.e. decreasing mental status, increasing breathing difficulty, decreasing blood pressure):
        a. Obtain medical direction for additional dose of epinephrine.
        b. Treat for shock (hypoperfusion).
        c. Prepare to initiate Basic Cardiac Life support measures.
    2. Patient condition improves. Provide supportive care.
        a. Oxygen
        b. Treat for shock (hypoperfusion).
- D. Communication
    1. What:
        a. Assessment findings
        b. Treatments
        c. Results of treatments
    2. Who:
        a. Personnel at receiving facility
        b. Other EMS providers
- E. Documentation
    1. What:
        a. Assessment findings (include the results of Advanced Spinal Assessment)
        b. Treatments
        c. Results of treatments
    2. Where:
        a. PCR
        b. Performance Improvement / Quality Improvement

APPLICATION

Procedural (How)

The instructor will demonstrate the following steps using an epinephrine auto-injector trainer and appropriate synthetic skin mannequin:

1. Perform assessment of patient with signs of a severe allergic reaction.
2. Obtain order from medical direction either on-line or off-line per Local Option Protocols.
3. Obtain auto-injector and ensure:
    A. Confirm medication is in date
    B. Medication is not discolored (if able to see).
4. If patient has prescribed auto-injector ensure prescription is written for the patient experiencing allergic reactions.
5. Remove safety cap from the auto-injector.
6. Place tip of auto-injector against the patient's thigh.
    A. Lateral portion of the thigh.
    B. Midway between the waist and the knee.
7. Push the injector firmly against the thigh until the injector activates.
8. Hold the injector in place until the medication is injected.
9. Dispose of injector in biohazard container.
10. Record activity and time.

Contextual (When, Where, Why)

The EMT-Basic will now be able to administer epinephrine via an auto-injectors. This will make a significant difference in those patients exposed to an allergic agent.

The administration of the epinephrine should be performed as soon as possible following appropriate identification of the allergic reaction.

STUDENT ACTIVITIES

Auditory (Hear)

1. The student should hear the assessment findings differentiating minor and severe allergic reactions.
2. The student should hear the steps required to appropriately administer epinephrine using an auto-injector.
3. The student will hear information on epinephrine.

Visual (See)

1. The student should see various audio-visual aids or materials showing the assessment findings relative to minor and severe allergic reactions.
2. The student should see an actual epinephrine auto-injector.
3. The student should see the instructor demonstrate the appropriate steps in using an auto-injector.

Kinesthetic (Do)

1. The student should practice the correct way to use an epinephrine auto-injector.
2. The student should practice role play treatment of a patient experiencing an allergic reaction.
3. The student should practice listening to lung sounds and being able to differentiate abnormal from normal sounds.
4. The student should practice re-assessment and documentation relative to the use of a epinephrine auto-injector.
5. The student will practice inspecting and reading the labels of epinephrine they will use on the EMS unit.

INSTRUCTOR ACTIVITIES

Supervise student practice.
Reinforce student progress in cognitive, affective, and psychomotor domains.
Redirect students having difficulty with content.

Evaluation

Written:	Develop evaluation instruments, e.g., quizzes, verbal reviews, handouts, to determine if the students have met the cognitive and affective objectives of this lesson.
Practical:	Evaluate the actions of the EMT students during role play, practice or other skill stations to determine their compliance with the cognitive and affective objectives and their mastery of the psychomotor objectives of this lesson.

Remediation

Identify students or groups of students who are having difficulty with this subject content and work with student(s) until they have met the cognitive, affective and psychomotor objectives of this lesson.

Enrichment

Identify what is unique in the local area concerning this topic and incorporate into local training modules.